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The Magnetic and Shielding Effects of Ring Current on Radiation Belt Dynamics

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The ring current plays many key roles in controlling magnetospheric dynamics. A well-known example is the magnetic depression produced by the ring current, which alters the drift paths of radiation belt electrons and may cause significant electron flux dropout. Little attention is paid to the ring current shielding effect on radiation belt dynamics. A recent simulation study that combines the Comprehensive Ring Current Model (CRCM) with the Radiation Belt Environment (RBE) model has revealed that the ring current-associated shielding field directly and/or indirectly weakens the relativistic electron flux increase during magnetic storms. In this talk, we will discuss how ring current magnetic field and electric shielding moderate the radiation belt enhancement.

Keywords: Radiation Belts, Ring Current, magnetic Storm, Relativistic electrons